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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,508	09/03/2004	Takayoshi Honma	046124-5314	1802

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DRINKER BIDDLE & REATH (DC)
1500 K STREET, N.W.
SUITE 1100
WASHINGTON, DC 20005-1209

EXAMINER	
INGHAM, JOHN C	
ART UNIT	PAPER NUMBER
2814	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,508	HONMA ET AL.	
	Examiner	Art Unit	
	John C. Ingham	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/13/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The amendments to the specification and drawings have been entered.

2. The amendments to the claims have been entered and the objection to claim 2 has been withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims **1 and 3-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bezama (5,870,823) and Juhala (US 5,764,675).

6. Regarding claim **1**, Bezama discloses in Fig 1 a semiconductor device comprising: M units (M is an integer of 2 or more) in which an element array composed by arranging a plurality of semiconductor elements (28) is mounted in a heat sink (12) having a cooling water passage (32, 34); and cooling water supply means (36) for connecting the cooling water passages of the M pieces of heat sinks contained in the M pieces of the units in parallel by water conveyance pipes, and which supplies cooling water which cools the semiconductor elements, wherein, in each of the M pieces of light emitting units, a conductive member (38, soldered to 12) of the cooling water passage is provided separately in the upstream direction or the downstream direction of the water conveyance pipe by a predetermined distance from the water inlet end or the water outlet end of the cooling water passage, and comes into contact with cooling water.

Bezama fails to specify (a) that the semiconductor elements are light emitting devices and fails to specify (b) a current supply means for electrically and serially connecting the M pieces of light emitting element arrays contained in the M pieces of light emitting units, and which supplies the electric current for making the semiconductor light emitting element emit light. Bezama also fails to specify that (c) a part of the cooling water passage has conductivity, that the conductive member (38) is connected electrically with the conductive portion, and that the current is supplied to the semiconductor light emitting element through the conductive portion of the heat sink.

Juhala teaches in Fig 5 a copper cooling element (items 3-7), used because it has good heat conductivity (col 4 ln 3-5), and shared by light emitting devices (Fig 7 item 26), where water cooling through conductive cooling water passages (Fig 9 item 2)

is used and furthermore, the diodes are operated in an electrical series (col 5 ln 50) since it is well known in the art that the demands on the power supply equipment is not as high as would be the case in a parallel circuit. Finally, electrical current is supplied to the element through conductive portions of the heat sink (5) in order to keep the cross section of the heat sink as small as possible (col 6 ln 60-64). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the electrical connection teachings of Juhala on the structure of Bezama in order to decrease the power supply demands and size of the circuit. It would have also been obvious to increase the heat conductivity by using copper to replace Bezama's heat sink. Finally, it would have been obvious to use the teachings of Juhala and realize that a diode array can replace the generic semiconductor devices as disclosed by Bezama.

7. Regarding claim **3**, Bezama and Juhala disclose the device of claim 1, wherein the heat sink (Bezama item 12 made of copper taught by Juhala) is made of a conductive material, and the conductive member (Bezama item 36) is fitted to the water inlet end or the water outlet end of the heat sink, and wherein the conductive member (36) is formed substantially like a funnel so as to extend its diameter towards the upstream direction of the downstream direction of the water conveyance pipe.

8. Regarding claim **4**, Juhala teaches the device of claim 1 wherein the semiconductor elements are semiconductor lasers (abstract).

9. Regarding claim **5**, Bezama and Juhala disclose the device of claim 1. The claim language, "wherein the semiconductor light emitting device irradiates plants with light to cultivate the plants" describes an intended use of the device. Intended use and other

types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997).

10. Claim **2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bezama and Juhala as applied to claim 1 above, and further in view of Calaman (US 6,397,932).

Bezama and Juhala disclose the device of claim 1, wherein the conductive member (Bezama flange item 38) is formed into a cylinder, and is interposed in the middle of the water conveyance pipe, and wherein the sectional area of the conductive portion of the cooling water passage (see Bezama Fig 3: item 50 compared to item 36) at the water inlet end or the water outlet end of the heat sink is smaller than that of the conductive member formed into the cylinder.

Bezama and Juhala fail to disclose that the water conveyance pipes are made of an insulating material. However, Bezama shows flanges on item 36 for holding a hose, which is conventionally insulating rubber, as shown by Calaman in Figure 5 (item 37). It would be obvious to one of ordinary skill in the art at the time of the invention to use thermally and electrically insulating material for the hoses, such as rubber, which flexes under high pressure from liquids, is hermetic, and prevents unwanted thermal interactions (col 5 ln 7, 12, 14).

Response to Arguments

11. Applicant's arguments, see page 7, filed 15 November 2006, with respect to the rejection(s) of claim(s) 1-5 under Hennig have been fully considered and are persuasive, but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John C. Ingham whose telephone number is (571) 272-8793. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

John C Ingham
Examiner
Art Unit 2814

jci

HOWARD WEISS
PRIMARY EXAMINER